

Prompt

Background of the Invention

The present invention

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The connectors fitted into mobile telephones are generally in the form of rectangular blocks. This type of connector has housings or compartments which contain the spring contacts. These housings open onto a "lower" first face and an "upper" second face of the connector. The lower face comes into contact with the printed circuit and the upper face comes into contact with the battery. A generally U-shaped spring contact inserted into the housing has two branches or arms and a base or bend of the U-shape interconnects the two branches at one end. The base of the U-shape is in the shape of a circular arc and lies in a plane perpendicular to the planes of the first and second faces of the connector. Each branch is adapted to make electrical contact with a device.

The first branch of the U-shape is fixed, for example soldered, to a printed circuit in contact with the first face of the connector. The second branch forms a boss projecting from the second face of the connector.

The current trend to miniaturization of electronic devices, such as mobile telephones, makes it necessary to reduce the size of the various components of such devices. In particular, connectors included in such devices must be small, for example with a thickness of up to 1.8 millimeters and other dimensions in the usual proportions.

In the prior art, reducing the thickness of the connectors and the total height of the spring contacts that they contain is possible only at the cost of a significant increase in the width or length of the connectors and the contacts. This is because the structure of existing spring contacts means that their total height can be reduced only by altering the first and third of the aforementioned three heights. To retain the technical characteristics of the contacts, reducing the first and third of these heights entails thickening

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invention. The housing opens onto both faces of the connector and the spring contact is positioned in the housing so that the plane containing the base of the U-shape is substantially parallel to the plane of the faces of the connector.

The base joining the first and second branches is inside the housing. It has a plane of curvature which is substantially parallel to the first and second faces. Increasing the width of the spring contact implies a small increase in the width of the connector. This is because the contacts are disposed so that the first branches of the contacts on the first face are aligned with the spaces between the second branches on the second face. This reduces the overall volume of the connector, which has previously been impossible.

The connector includes means for guiding the spring contact into the correct position in the housing.

It also includes retaining means for maintaining this correct position.

If it is necessary to use a plurality of connections, the connector includes a plurality of housings receiving respective U-shaped spring contacts.

To keep the volume of the connector sufficiently small, the spring contacts in two adjacent housings are positioned so that they are substantially parallel but the opposite way round, one branch of one contact being adjacent the other branch of the adjacent contact.

The branches of the spring contacts are arranged to produce an area with no spring contacts in the middle of the second face. A suction pipette can be applied to this area. The connector can therefore be picked up by a single pipette.

Brief Description of the Drawing
The invention will be better understood on reading the following description and examining the accompanying drawing. In the drawing, which is given entirely by way of non-limiting and illustrative example of the invention:

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Detailed Description of the Invention

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by the first and second faces. However, it can instead be oblique to those planes. In this case, the expression "plane of curvature" refers to the plane into which the curvature is projected along an axis perpendicular to the first and second faces.

In the invention, the two branches 11 and 12 are in respective divergent planes 11.1 and 12.1 and the intersection I of the two planes is within the base 13 of the U-shape.

Also, in the example shown, the plane 11.1 of the branch 11 and the plane 13.1 are substantially coincident.

The first branch 11 is rectangular with two bayonet-type offsets or steps 14 and 15. The two steps 14 and 15 define three portions of the first branch 11. A first portion 16 consists of the end of the first branch 11. The end 16 is a free end adapted to be connected, and in particular soldered, to a printed circuit. A second portion 17 between the steps 14 and 15 is a plane portion. The portion 17 is adapted to be retained in the housing 4 of the body 1. A third portion 18 is defined between the step 15 and the base 13. The portion 18 is mobile in a plane orthogonal to the plane formed by the portion 17. The portion 18 is mobile relative to the portion 17 by virtue of a hinge formed by the step 15. The step 15 also stiffens the branch 11.

The second branch 12 includes a first area 19 forming a shoulder and a nose 20. A first portion 21 of the second branch 12 is defined between the area 19 and the nose 20. The area 19 hinges the portion 21 relative to the plane of curvature 13.1. The first portion 21 is plane and rectangular. In the example shown, the nose 20 and the portion 21 are adapted to come into contact with one terminal of a battery held against the branch 12 projecting from the second face 3. The nose 20 separates the first portion 21 from a second portion 22 of the second branch 12 by forming a projecting corner such that

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first face 2 opposite the first side 31. Both sides 31 and 32 of the connector are therefore fixed to the printed circuit. Because the connector is therefore fixed more firmly, it is not necessary to provide additional soldered joints to guarantee mechanical location of the connector.

To free up an area 33 on the second face 3 sufficient for a pipette, the spring contacts 7 are disposed in a particular manner. The area 33 is required to be centrally located. It enables the connector to be picked up by a single pipette having a diameter of at least 2.5 mm.

The connector further includes recesses or cavities 34. The cavities 34 are formed in two lateral faces 35 and 36 of the respective sides 31 and 32 of the connector 1 and in such a way that the free ends 16 of the spring contacts 7 inserted into the body 1 project from the sides 31 and 32 via the cavities 34. The ends 16 are therefore visible from the side of the second surface 3 for soldering them. This facilitates soldering the ends 16 to a printed circuit.